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By
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A field of good Korean lespedeza in southern Ohio

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Lespedeza is the name of a large group of annual and perennial legumes. In this group are several members that have taken on great agricultural importance in the southern Corn Belt and the northern Cotton Belt in recent years. That is because of their value for pasture, hay, soil improvement, and erosion control, and their greater tolerance of drouth and soil acidity, as compared to the common clovers.

Although there are many native lespedezas, all those of particular agricultural value have been imported or developed from imported varieties. Most of the varieties now in general use are annual plants—that is, they come from seed *each year*. That means they must ripen seed in the fall in order to continue in the field. An exception to that is sericea lespedeza, a perennial that has attained some prominence as a midsummer pasture, soil improvement, and erosion control crop.

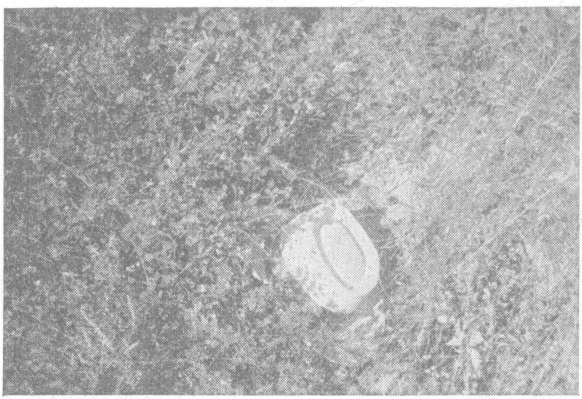
The area in Ohio in which lespedezas are grown. The heavier shaded area is that of best adaptation and is where lespedezas are recommended.

Annual Lespedezas

Common Lespedeza. The first of this legume to be brought into this country came from east Asia about 100 years ago and is now our common lespedeza in pastures of southern Ohio. It is frequently referred to as Japanese lespedeza or Japan clover. In the early day this plant did not attract much attention, but during the Civil War it was given considerable distribution by the movement of armies. Following the war, it gradually spread, both as a cultivated and wild volunteer plant, through southeastern United States. It reached Ohio as a volunteer plant in pasture and waste lands some time prior to 1900. In the South, it is a valuable hay and pasture crop, but in Ohio it has value as pasture, and only in the southern fourth of the state. It is present in probably three-fourths of a million acres of permanent pasture. Formerly, common lespedeza was frequently included in permanent pasture seed mixtures recommended for southern Ohio. Since it has now become established in most pastures to which it is adapted, and since the seed of this variety is scarce and other superior varieties are available, it is no longer generally included in such recommended mixtures.

Kobe Lespedeza, an improved variety of the common, was brought to this country from east Asia in 1920 by a representative of the United States Department of Agriculture. This improved variety is slightly earlier, grows taller, yields more, and is more highly valued than the common as a hay and pasture crop in the South. Its northern limit in Ohio is about the same as the common. It yields no more than Korean and is not recommended.

Korean Lespedeza, now our most commonly used variety, was sent to the Division of Foreign Plant Introduction of the United States Department of Agriculture, by Ralph Mills, a medical missionary in Korea, in 1919. Its superiority was soon evident and it spread rapidly. As a result of adaptation trials, begun at experiment station farms in Ohio in 1922, it soon earned a place in depleted permanent pastures in the southern third of the state. It grows taller than the common and matures earlier than Kobe. It is extensively used in pasture mixtures in southern



Korean lespedeza limed and fertilized on the left, and without treatment on the right.

Ohio. Under favorable conditions yields of 1½ to 2 tons of hay per acre have been obtained by farmers and in experiment station trials in this and adjoining states. One farmer in Pike County baled 24 tons of hay from 12 acres. However, under average farm conditions, yields of one-half to a ton per acre are common. As a hay crop, it is distinctly inferior to the to the true clovers, where they can be grown, and it is not generally recommended for hay anywhere in Ohio.

Other Annual Varieties: There are a number of other annual varieties, most of them selections from Korean that have some merit for pasture in southern Ohio, but their superiority has not been generally demonstrated, and seed is not available on the commercial market.

Perennial Lespedeza

Sericea is a perennial variety that grows well in southern Ohio, producing, under favorable conditions, 2 to 2½ tons of hay per acre. It resembles alfalfa in some degree in habit of growth and method of handling, except that sericea cannot safely be cut more than once a season. Unless cut early the hay is woody and not very palatable. If cut when the plants are 12 to 15 inches high a much better quality of hay results, however tannin content is too high to make an ideal livestock feed, either as hay or pasture. It has been tried at various places and times in Ohio since 1932. It grows well when established, but considerable difficulty has been experienced in establishment. While sericea lespedeza is not generally recom-

September picture of an April seeding of sericea lespedeza.

mended as a hay or pasture crop in Ohio, it does have a place for soil improvement and erosion control. On a few farms in the southern part of the state, sericea is being used for hay and mid-summer pasture with results that at least satisfy the farmers using it.

Present interest in sericea goes back to 1924, when seed was brought from Asia. It had, however, been tried, discarded, and forgotten on two previous occasions. One of those was by Gerald McCarthy, of the North Carolina Experiment Station, who obtained seed from Japan in 1896. The other was by the United States Department of Agriculture in 1900, from seed supplied by S. A. Knapp. Further pasture trials with this legume are in progress in southern Ohio. The results to date are not very promising.

The Lespedezas Compared to Other Legumes

Under conditions favorable to the common clovers and alfalfa in Ohio, all the lespedezas are inferior as hay and pasture plants. They do not yield as much per acre, and are generally lower in protein and mineral content than clover and alfalfa. Much land in Ohio, however, does not at present produce ideal clover and alfalfa crops, and it is there that the lespedezas have a place. This is obvious from the wide distribution the common and Korean lespedezas have attained and from the favor they have gained among farmers in the southern third of the state. If all the land in Ohio were improved to a level of optimum production, there probably would be little need for the lespedezas, but until that condition is attained, they are likely to play an important role in the agriculture of southern Ohio, especially on the more acid upland soils of the southeastern part of the state.

Although lespedezas will grow on land too badly depleted for the profitable production of many other crops, they respond well to lime and fertilizer, and land devoted to them should be so treated. The best lespedeza yields come when the land has been limed and fertilized to the clover level and this, of course, eliminates much of the need for lespedeza. Eventually under this more favorable lime and fertilizer level in a permanent pasture, bluegrass and white clover become so thrifty that the common and Korean lespedezas are generally crowded out.

The lespedeza nodule-forming bacteria are different from those on the clovers and all seed should be inoculated.

How Lespedezas May Be Used

In Permanent Pasture. In the southern third or fourth of the state Korean should be seeded early in March on all thin permanent pastures where it has not already been growing. The rate of seeding may vary from 6 to 12 pounds per acre. The stand from the lighter rate of seeding will thicken with succeeding years if the pasture is not over-grazed. However, if considerable extra pasture is needed during the immediate year, the heavier rate should be used. This legume makes most rapid growth in the

warm weather after the middle of July and aids greatly in maintaining pasture production during that period.

Since pastures, properly supplied with lime, phosphate, and potash produce feed at a lower cost than those not so treated, regardless of the type of pasture plant, such lime as is needed and 500 pounds of 20 per cent superphosphate, or 0–14–7, should also be applied. Where the pasture is being adequately limed and fertilized, ¼ to ½ pound each of Ladino and Louisiana, or other common white clover, should be added to the lespedeza seeding for the purpose of providing more pasture. Where the land is suited to growing those clovers, they will replace the lespedeza. Close grazing the fall before such seeding, and disking or other light working of the soil on the contour before or when fertilizing and seeding, are recommended. The lime and fertilizer not only increase the pasture yields but improve the protein and mineral content of the pasture. Plants grown on poor soil may appear all right to the human eyes but they are less attractive to livestock, lower in feed value, and frequently are not efficient in meat and milk production as plants grown on properly treated land.

Sericea, for mid-summer grazing may also be established in permanent sod land by the "renovation" or "trash mulch" method. However, some difficulty has been experienced in getting stands by this procedure unless the job is very thoroughly done. It has been found necessary to so completely kill the old vegetation that little competition is offered the sericea seedlings.

For Hay and Rotation Pasture. Where the land is thin and unsatisfactory stands and growth of red clover are being obtained, Korean lespedeza is being added to the ordinary clover-grass hay and pasture mixture by some farmers in the southern part of the state.

The lespedeza does not contribute much directly to the hay yield the first year, since it is not tall enough to be included when the clover and grass are cut, but it does increase the nitrogen supply of the soil. Thus it indirectly increases the grass yield and itself makes good pasture in the lat summer and fall. If the meadow is held beyond one year, it then becomes largely a grass-lespedeza combination, in which grass supplies the chief growth in the early part of the season and the lespedeza later. From the pasture point of view, the combination provides good distribution of production the first year and in succeeding years. It is recommended for that purpose on thin land where clover growth is unsatisfactory in the southern part of the state.

The inclusion of the lespedeza is not a justification for the omission of lime and fertilizer, to both of which lespedeza gives a profitable response. The lime should be applied in such amount as is needed for clover and a fertilizer, such as 3–12–12 or 4–12–8 with winter grain or 0–12–12 or 0–14–7 with spring grain, used at grain seeding time at the rate of 300 or 400 pounds per acre. The seeding may be made with either a winter or spring grain crop or alone on prepared land in April.

A simple rotation pasture seed mixture for spring seeding is 15 pounds of Korean lespedeza and 6 pounds of orchard grass or tall fescue. A crop of grass hay may be removed early in the season, if desired. A third type of seeding, sometimes used but less satisfactory for erosion control, consists of 20 to 30 pounds of Korean lespedeza only.

The lespedezas, being heat resistant, give good growth in late July, August, and September. If Korean lespedeza is cut early, a second growth will produce some seed for volunteer reseeding. If cut late, some ripe seed will be shattered. Intermediate cutting leaves no seed.

Sericea, likewise, may be seeded in small grain or alone as a hay or mid-summer pasture crop in the regular crop rotation where the land lacks an adequate supply of lime and mineral nutrients. It should, if used, be seeded at 15 pounds per acre, along with a grass at the usual rate. The seed should be inoculated.

In Small Grain-Lespedeza Pasture Rotation. A practice followed in some other states, notably Missouri, has been to use a one-year rotation of Korean lespedeza and winter grain for pasture or grain. The lespedeza is seeded only once and that in the spring when the system is established. After the removal of the grain crop, as grain or pasture, the lespedeza is grazed but not too severely to permit seed setting. This is disked in the fall, fertilized liberally with a high potash fertilizer, such as 300 pounds of 0–12–12, and seeded again to grain. The next year, there is a volunteer crop of lespedeza from that disked in, and again the grain and lespedeza may be utilized in the same manner.

As Soil Builders. There has been much said and written about these soil builders. When the annual lespedezas approach maturity, the nitrogen is nine-tenths in the tops and one-tenth in the roots. The tendency for mineral concentration is of the same nature. It is evident from these facts that the annual lespedezas, when plowed under or left on the land, would be soil improvers, but, when removed, they, like other annual legumes, such as soybeans, may become soil-depleting crops. It is well for every lespedeza grower to keep this in mind. Otherewise, he may suddenly realize after some years, that his soil is poorer than when he started growing lespedeza.

The perennial, sericea, has a large root system and so a greater amount of nitrogen, minerals, and organic matter is in the roots. This legume is efficient in taking nutrients from an unavailable form and leaving them in a form available to other crops when the lespedeza plant is destroyed. It also accumulates a heavy mulch of leaf mold on the surface if not cut or pastured. The Tennessee Experiment Station grew sericea without cutting or pasturing for three years on what they termed "30-bushel corn land." Then, they plowed it under and grew corn continuously for the next 6 years. The first year of corn after sericea yielded above 60 bushel per acre, and the beneficial effect was still evident in the fifth and sixth years.

For Soil Improvement and Seed Production. Frequently, it happens that a piece of land has become badly depleted and it is desirable to retire it from corn and small grain crop production for a few years. During that time, some soil building crop should occupy the land. While red clover, alfalfa, and sweet clover are all excellent soil builders, in some instances they are not adapted to the land in question. In cases of this kind, the land may be prepared, as for oats in the spring, and seeded to 20 to 30 pounds of Korean or sericea lespedeza alone or with a spring-seeded grain. The grain crops, if seeded, may be left on the land or removed as grain or pasture. The use of 300 pounds of 0–14–7 or 0–12–12 as a starter is also advisable. Once the lespedeza has been established, it will take care of itself more or less indefinitely. Sericea is better suited to this purpose than is Korean.

If some income from the area is desired during the building up process, seed crops may be removed. In the case of sericea, this may be done by binder, mover, or combine, but the straw should remain on or be returned to the land. For harvesting the seed of the Korean lespedeza, either the mower or combine can be used.

Sericea for Erosion Control. While any soil cover helps in erosion control and the use of lespedezas as previously indicated is helpful, there are frequently badly eroded and gullied areas deficient in lime and unsuited to extensive soil preparation and treatment that are serious problems. There sericea fits better than other legumes. The soil of such areas should be sufficiently disturbed early in the spring to provide a light covering for the seed. A thin mulch of 1 to 2 tons of straw or old hay per acre on exposed areas will help greatly also in getting the new seeding started. Fifteen to 20 pounds of scarified seed or 30 to 40 of unhulled seed should be used per acre.

During the first year, all livestock should be kept off. Preferably, this should continue in later years, but limited grazing will not be serious, since the stock are not overly fond of the older sericea and are not likely to damage it in later years if they are not on too early in the spring or the grazing load is not too heavy later in the season.

Conclusion

Lespedezas have been a source of increased income through better pasture, hay, and livestock, and also have improved soil on many farms. In the hands of careful farmers, who have accompanied the use of the lespedezas with treatment, they have been the means of making good land out of depleted unprofitable soils. On the other hand, as used by careless, indifferent farmers, without accompanying soil treatment, they have added only a small temporary increase in income, possibly at the expense of the long-time income, and have contributed nothing to the permanent wealth and social status of the farm family or the community. It is true with the lespedezas, as with so many other things, that the human element with which they are associated determines their value.